
New and Interesting Milkweeds (Apocynaceae, Asclepiadoideae)

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ABSTRACT. *Matelea corrugata*, from Costa Rica, *M. costaricensis*, from Costa Rica, *M. emmartinezii*, from Mexico, *M. ferruginea*, from Guatemala, *M. filipes*, from El Salvador, *M. haberi*, from Costa Rica, *M. insolita*, from Nicaragua, and *M. velutinoides*, from Mexico and Guatemala, are described as new. The new combinations *Ditassa nigrescens* (= *Ditassa tatei*), *Gonolobus glaberrimus* (= *Matelea tikalana*), *Marsdenia fruticosa*, and *Polystemma guatemalense* (= *Matelea quirosii*), are proposed, and the latter two are lectotypified. *Asclepias angustifolia*, *A. auriculata*, *A. similis*, *Gonolobus barbatus*, *G. erianthus* (= *G. macranthus*), *G. guatemalensis*, *Marsdenia gymnemoides*, *Matelea gentlei*, and *Pherotrichis schaffneri* are lectotypified or neotypified. The typification, synonymy, and application of *Pherotrichis villosa* are discussed.

Key words: Apocynaceae, Asclepiadoideae, Mesoamerica, Guianas, *Asclepias*, *Ditassa*, *Gonolobus*, *Marsdenia*, *Matelea*, *Pherotrichis*, *Polystemma*.

In the course of ongoing studies of milkweeds, several new species, new combinations, and nomenclatural trivia have come to light and are presented here.

Asclepias angustifolia Schweigger, Enum. Pl. Hort. Regiom. 13. 1812. TYPE: Hort. Saltzwedel, Frankfurt, Oct. 1825, G. Engelmann s.n. (neotype, here designated, MO-2761538).

Woodson (1954) discussed the application of this name, which he was substituting for the then better known *Asclepias rubricaulis* HBK. *Asclepias angustifolia* Schweigger was based on a plant cultivated at the Königsberg botanical garden, acquired from the Berlin botanical garden. If a type specimen existed, it probably would have been at KBG and is no longer extant. Woodson (1954) suggested that herbarium specimens at MO, prepared from plants cultivated in other German botanical gardens during that era, and bearing Schweigger's name, probably represented the original introduction and serve to fix the usage of the name. Woodson was clearly neotypifying *Asclepias angustifolia*, but since there are four specimens at MO fitting his general de-

scription it seems prudent to select one specimen to formalize this decision.

Woodson (1954: 151) cites "*Gomphocarpus angustifolius* Link" as a synonym of *Asclepias fruticosa* L. However, "*Gomphocarpus angustifolius* Link" is actually a combination based on *Asclepias angustifolia* Schweigger, *Gomphocarpus angustifolius* (Schweigger) Link and surely was included in the synonymy of *A. fruticosa* in error. Goyder and Nicholas (2001) list *Gomphocarpus angustifolius* and its basionym as possible synonyms of *G. fruticosus* (L.) W. T. Aiton, based on Woodson's synonymy, but note that the type is no longer extant and the identity uncertain. Therefore, this neotypification clarifies the synonymy of *Gomphocarpus fruticosus* by removing *Asclepias angustifolia* Schweigger and *Gomphocarpus angustifolius* (Schweigger) Link as candidates.

Asclepias auriculata HBK, Nov. Gen. Sp. (quarto ed.) 3: 191, t. 228. 1819. TYPE: Nov. Gen. Sp. (quarto ed.) 3: t. 228. 1819 (lectotype, designated here).

The original description cites "Crescit locis alsis prope Ario Mexicanorum, alt. 1000 hex. . . Floret Septembri." Woodson (1954) gives the type as *Bonpland s.n.*, but did not see a specimen. Original material still has not been located, and in its absence I propose the original plate as the lectotype.

Asclepias similis Hemsley, Biol. Cent.-Amer., Bot. 2(10): 326. 1881. TYPE: "South Mexico, Chiapas etc.," A. Ghiesbreght 666 (lectotype, designated here, K; duplicates of lectotype, G, MO).

Hemsley cited two collections in his description of the species, *Ghiesbreght 665* and *666*, both at K. Woodson (1954) gives *Ghiesbreght 665* at MO as a type. While this could be considered a lectotypification, Woodson's "Index to Exsiccatae" in the same publication lists *Ghiesbreght 665* as *Asclepias pellucida* E. Fournier and *Ghiesbreght 666* as *A. similis*. The actual specimens of both collections at MO were annotated by Woodson as *Asclepias similis*. *Asclepias similis* and *A. pellucida* are sympatric

in southern Mexico and, as noted by Standley and Williams (1969), are difficult to distinguish without follicles. Although I agree with Woodson's determinations of both collections as *Asclepias similis*, and neither collection has follicles, it still seems important that *Asclepias similis* be lectotypified, and *Ghiesbreght 666* is the less ambiguous choice.

Ditassa nigrescens (E. Fournier) W. D. Stevens, comb. nov. Basionym: *Astephanus nigrescens* E. Fournier, Ann. Sci. Nat., Bot., sér. 6, 14: 367. 1882. TYPE: Venezuela. "Guyana Anglica, pr. Boraima," *M. Schomburgk 915* (holotype, B not seen).

Ditassa nigrescens is a rather common species in the adjacent areas of Venezuela, Guyana, and Brazil. The species was treated as *Ditassa tatei* Gleason & Moldenke (in Gleason, Bull. Torrey Bot. Club 58: 456. 1931. Holotype: Venezuela. Esmeralda, *R. Tate 199*, NY, = *Cynanchum tatei* R. W. Holm) in the *Flora of the Venezuelan Guayana* (Morillo, 1997). However, the original diagnosis of *Ditassa tatei* cited two collections in addition to the type: *R. Spruce 3226* (K) and *Schomburgk 915* (B). Since *Schomburgk 915* at B was already the holotype of *Astephanus nigrescens*, *Ditassa tatei* is a superfluous name under Article 52 of the *Saint Louis Code* (Greuter et al., 2000), and clearly the two concepts are synonymous.

Gonolobus barbatus HBK, Nov. Gen. Sp. (quarto ed.) 3: 209, t. 239. 1819. TYPE: Nov. Gen. Sp. (quarto ed.) 3: t. 239. 1819 (lectotype, designated here).

The original description cites "Crescit in litore Mexicano, prope Campeche." Original material has not been located and in its absence I propose the original plate as the lectotype.

Gonolobus erianthus Decaisne, in A. de Candolle, Prodr. 8: 592. 1844. *Vincetoxicum erianthum* (Decaisne) Arthur, Torreyana 21: 11. 1921. TYPE: Mexico. Veracruz: Bois près Jalapa, 4000 ped., *H. Galeotti 1519* (lectotype, designated here, P; duplicates of lectotype, BR, G, K, P).

Decaisne published *Gonolobus erianthus* either as a replacement for a putative later homonym ("*G. grandiflorus* Benth.," not *G. grandiflorus* (Cavanilles) R. Brown ex Schultes) that was never published or perhaps in recognition that Bentham's application of the name was in error, but in either case must be considered to be newly described by De-

caisne. The selected lectotype is the best of the four specimens at P cited by Decaisne; the unselected syntypes are: *H. Galeotti 1532* (BR, P), *1539* (BR, P), and *K. Hartweg 211* (GH, K, NY, P). The name *Gonolobus macranthus* Kunze (Linnaea 20: 27. 1847) is, from the diagnosis, clearly synonymous with *G. erianthus*, and was used for the species in *Flora de Nicaragua* (Stevens et al., 2001); it was based on cultivated material from Mexico and any original specimens or illustrations, if such existed, were at LZ and are no longer extant (Peter Otto, pers. comm.).

Gonolobus glaberrimus (Woodson) W. D. Stevens, comb. nov. Basionym: *Matelea glaberrima* Woodson, Ann. Missouri Bot. Gard. 28: 281. 1941. TYPE: Guatemala. Petén: Uaxactun, 24 Mar. 1931, *H. Bartlett 12300* (holotype, MO; isotypes, MICH, MO, US).

Matelea tikalana Lundell, Phytologia 16: 446. 1968. Syn. nov. *Marsdenia tikalana* (Lundell) Lundell, Wrightia 4: 49. 1968. TYPE: Guatemala. Petén: Tikal Nat. Park, 20 Mar. 1959, *C. Lundell 15763* (holotype, LL).

Gonolobus glaberrimus is most closely related to *G. hammelii* W. D. Stevens and *G. hadrostemma* W. D. Stevens, from which it differs by having glabrous leaves among many other obvious characters; the three species are anomalous in *Gonolobus* in having a massive corona adnate to the faucal annulus and in lacking free appendages on the anther backs, but seem better placed in *Gonolobus* than in *Matelea*. *Matelea tikalana* is placed into the synonymy of *Gonolobus glaberrimus* because the two type collections are virtually identical.

Gonolobus guatemalensis K. Schumann, in Engler & Prantl, Nat. Pflanzenfam. 4(2): 302. 1895. TYPE: Guatemala. Alta Verapaz: Pansamalá, 4000 ft., Apr. 1887, *H. von Tuerckheim 1124* (lectotype, designated here, US).

Gonolobus velutinus Schlechtendal var. *calycinus* J. D. Smith, Bot. Gaz. 13: 189. 1888. TYPE: Guatemala. Alta Verapaz: Pansamalá, 4000 ft., Apr. 1887, *H. von Tuerckheim 1124* (holotype, US).

Schumann intended *Gonolobus guatemalensis* to be a new name for "*G. velutinus* Donn.-Smith, nicht Schlecht.," but technically the name must be considered newly published by Schumann. Schumann's key adequately diagnoses the species and this lectotypification simply formalizes his obvious intention of renaming Smith's taxon by selecting the same type.

Marsdenia fruticosa (J. D. Smith) W. D. Stevens, comb. nov. Basionym: *Nephradenia fruticosa* J. D. Smith, Bot. Gaz. 16: 196. 1891. TYPE: Guatemala. Alta Verapaz: rocky islands in Río Rubelcruz, Apr. 1889, *J. Smith 1742* (lectotype, designated here, US).

While Smith's diagnosis intentionally distinguished *Nephradenia fruticosa* from *N. neriifolia* (Decaisne) Benth & J. D. Hooker (= *Marsdenia neriifolia* (Decaisne) Woodson), it has always been considered a synonym of the same, e.g., by Woodson (1941), Standley and Williams (1969), and Omlor (1998), probably because the two species have an erect, *Asclepias*-like habit, unique among North American *Marsdenia*, and are practically indistinguishable from each other vegetatively. However, the flowers and fruits of the two species are quite different. *Marsdenia fruticosa* has cream-colored flowers versus purple in *M. neriifolia*; a campanulate corolla with the tube longer than the lobes versus rotate with the lobes longer than the tube; corona lobes that are widest at the base and connected to the anther back by a thin wing versus widest in the middle and directly adnate to the anther back; follicles that are short and broad versus long and thin; and seeds that are without a coma and have a thick, spongy wing versus normal comose seeds without corky wings. Several genera of milkweeds have a species or two that have lost the seed coma and develop spongy wings associated with becoming rhyophytes, and this species is apparently a rhyophyte. *Marsdenia fruticosa*, *M. neriifolia*, and *M. laxiflora* J. D. Smith (a twining or trailing species) are clearly closely related, and seem to be relatively isolated among North American *Marsdenia*. The unselected syntype of *Nephradenia fruticosa* is *H. von Tuerckheim 1251*, US.

Marsdenia gymnemoides W. Rothe, Bot. Jahrb. Syst. 52: 409, t. 3. 1915. TYPE: Guatemala. Huehuetenango: Nentón, Uaxac kanal, July 1887, *C. Seler & E. Seler 2804* (lectotype, designated here, F).

The two syntype collections (*C. Seler & E. Seler 2804, 3093*) were both at B and are no longer extant. A fragment of one of the syntypes is at F and is chosen as the lectotype. Lectotypification seems especially important in this case because Rothe's (1915) drawing of *Marsdenia gymnemoides* is ambiguous, combining some characters of *M. gymnemoides*, as represented by the lectotype, and *M. tubularis* L. O. Williams, a similar and nearly sympatric species.

Matelea corrugata W. D. Stevens, sp. nov. TYPE: Costa Rica. Puntarenas: Reserva Forestal Golfo Dulce, Aguabuena, sector oeste, 50–150 m, 8°42'20"N, 83°31'30"W, 17 Dec. 1991, *R. Aguilar 764* (holotype, MO). Figure 1.

A speciebus *Matelearum* indumento simplici foliis coriaceis crassinervibus corona simplici polliniis triquetris profunde excavatis indumento corollae singulari distinguenda.

Coarse woody vine, older stems and base unknown, latex white, young stems densely pilose, obscuring surface, trichomes 0.5–1 mm long, straight or twisted, yellow fading to dull white, erect to deflexed, internodes 3–11 cm. Leaves opposite, blades elliptic or slightly ovate or obovate, coriaceous, 6–13.2 × 2.2–6.3 cm, apex abruptly acuminate, base obtuse, rounded, truncate or shallowly cordate, sinus to 2 mm deep, adaxially glossy, sparsely appressed-scabrous, trichomes 0.2–0.7 mm long, abaxially densely appressed-pilose, obscuring surface, trichomes 0.7–1 mm long, lateral veins 6 to 8 pairs, prominent above and below, middle veins 45°–55° to midrib, colleters 4 to 10, long and curved, irregularly scattered along the basal 5–15 mm of midrib; petiole 1.2–3.7 cm, densely pilose. Inflorescence congested-racemiform, densely pilose, peduncle 0–2 mm, pedicel 3–8 mm, bracts 0.7–1.5 × 0.3–0.5 mm, deltate, pubescent; calyx tube 1–1.2 mm long, with 1 colleter per sinus within, lobes elliptic, obovate or spatulate, cucullate, 4–6.5 × 3.5–3.6 mm, apex rounded, green, densely appressed-pilose outside, trichomes 0.2–0.5 mm long, glabrous inside; corolla briefly campanulate and then rotate, brown, sometimes with pale purple in center, abaxially glabrous except sparsely appressed-pilose in the center of the lobes, trichomes 0.2–0.3 mm long, adaxially hispidulous in a ring in the tube and in 5 radial lines opposite the anthers connecting the ring with the corona, thus leaving 5 trapezoidal glabrous patches in the base of the tube alternate with the anthers, trichomes ferruginous, ca. 0.05 mm long, corolla tube 2.5–4 mm long, lobes broadly elliptic, asymmetrical at the base, 3.8–5.5 × 6–7 mm, apices rounded and emarginate, patent, one side of each lobe verrucose within; gynostegium sessile, corona a fleshy disk more or less hidden below gynostegium, apparently purple or reddish purple, outer margin shallowly 5-lobed and finely and inconspicuously dentate, ca. 0.7 mm wide at the lobes and 0.5 mm wide between the lobes, with 5 raised cushions alternate with the anthers; anthers trapezoidal in outline, dorsally with a pair of horny ridges, 0.7–0.9 × 1.3–1.8 mm, guide rails straight, flaring apart ca. 45° and tilted

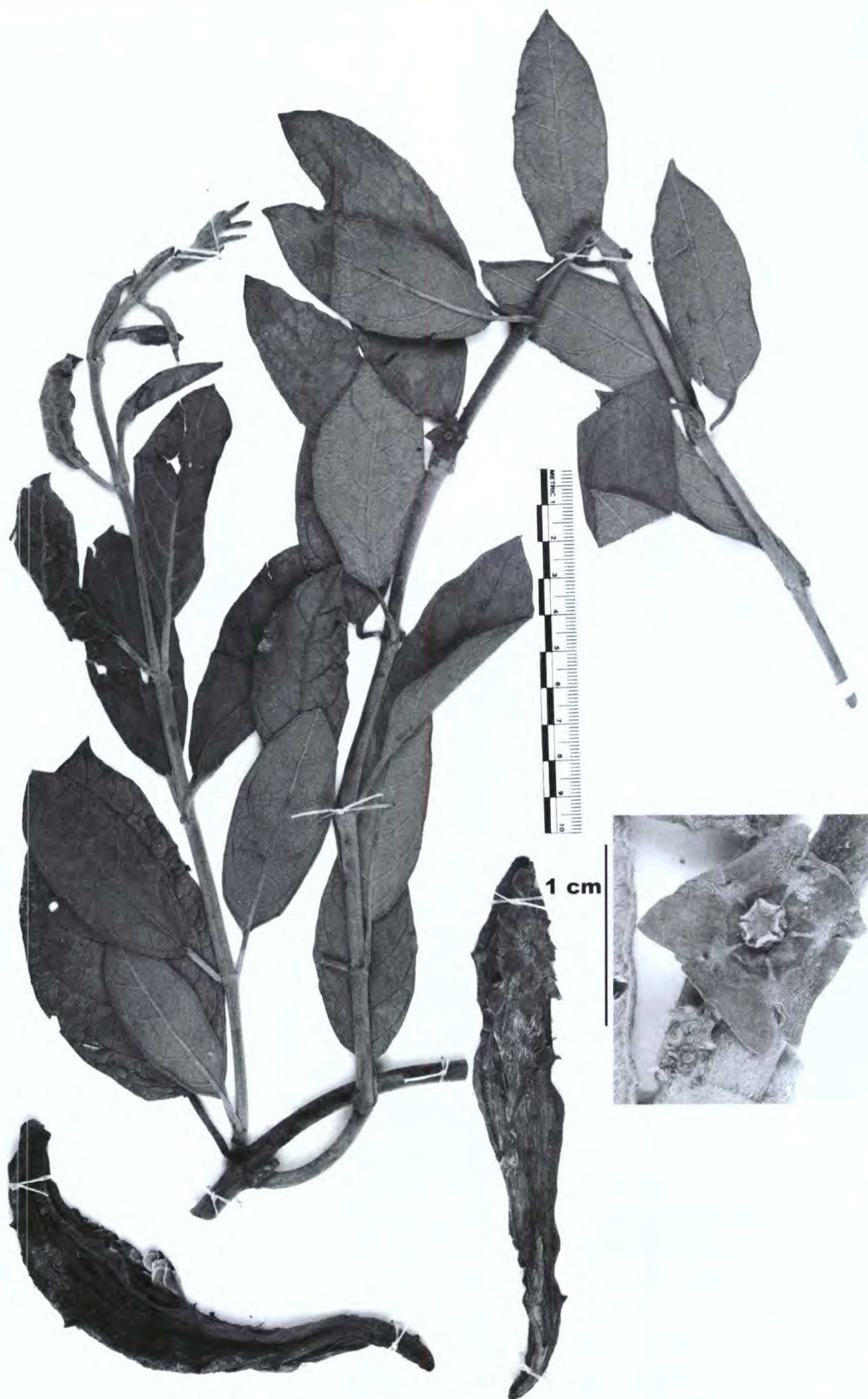


Figure 1. *Matelea corrugata* W. D. Stevens. Scan of holotype specimen (Aguilar 764, MO).

ca. 45° under style apex, 0.2–0.3 mm long, terminal appendages narrow strips appressed to margin of style apex, $0.2\text{--}0.4 \times 0.9\text{--}1.3$ mm, white; corpusculum $0.24\text{--}0.31 \times 0.10\text{--}0.13$ mm, ellipsoid to subsagittate, brown, translators $0.31\text{--}0.38 \times 0.14\text{--}$

0.19 mm, slightly curved, flat, pollinia $0.69\text{--}0.76 \times 0.46\text{--}0.51$ mm, asymmetrically ovoid, strongly 3-dimensional (triquetrous), sterile and deeply excavated in proximal half, forming a tube into center of the pollinium; style apex 2.3–2.7 mm wide, pen-

tagonal, slightly concave, apparently brown. Follicles fusiform, 12–15 × 3–3.5 cm, apex acute to attenuate, base acute, green or green-black, densely ferruginous-pilosulose, with scattered broad-based, conical prickles (ca. 3 per cm²), prickles 2–4 mm long, 1–3 mm wide at middle; seeds obovate, 10–11 × 5.5–6.5 mm, brown, margin 0.6–1.2 mm wide, entire or inconspicuously undulate, surface smooth, coma ca. 2.5 cm long, tawny.

Matelea corrugata is distinctive in appearance and not clearly related to any other Mesoamerican species, although clearly falling within the current circumscription of *Matelea*. The pattern of corolla indumentum and the pollinium shape, as described above, are unique. Two of the collections, including the type, are from lower elevation (50–600 m) wet forest in southeastern Costa Rica and two are from higher elevation (900–1200 m) cloud forests in northern Costa Rica, but the four collections are practically identical. *Matelea corrugata* has been collected in flower in September, November, and December.

Paratypes. COSTA RICA. **Alajuela:** San Ramón, Zapotal, Rfo Barranquilla, *E. Bello C. & E. Cruz L. 5313* (MO); Monteverde Cloud Forest Reserve, Río Peñas Blancas, *W. Haber & E. Bello C. 6399* (MO). **Puntarenas:** Osa Sierpe, entre Cerro Chocuaco y Cerro El Faro, *G. Herrera C., R. Soto & P. García M. 4610* (MO).

Matelea costaricensis W. D. Stevens, sp. nov.

TYPE: Costa Rica. San José: Cantón de Acosta, Hda. Tiquires, camino a Aguas Buenas, 1600–1800 m, 9°43'10"N, 84°10'50"W, 3 June 1995, *J. Morales 4283* (holotype, MO). Figure 2.

Mateleae pinguifoliae et *M. pseudobarbatae* affinis, sed differt corolla intra hispidulosa corona fere integra.

Vine, herbaceous or somewhat woody, base unknown, latex white, young stems with mixed indumentum, long trichomes moderately dense, 1–3 mm, straight, pale yellow, spreading, short trichomes dense, 0.1–0.2 mm, straight, white, glandular trichomes dense, ca. 0.1 mm, brown, internodes 7–17 cm. Leaves opposite, blades ovate, 6–12.2 × 3.4–7.2 cm, apex acuminate, base lobate, lobes convergent to overlapping, sinus 0.8–2.5 cm deep, adaxially with moderately dense long and short trichomes, long trichomes 0.5–1.5 mm, sometimes with sparse glandular trichomes on veins and at base, abaxially with dense short and glandular trichomes, sometimes with a few long trichomes on veins, lateral veins 5 to 7 pairs, middle veins 40°–45° to midrib, colleters 7 to 12; petiole 2–7.5 cm, with mixed indumentum, long trichomes sometimes

sparse. Inflorescence racemiform or congested-racemiform, with mixed indumentum, peduncle 9–34 mm, axis to 7 mm, pedicel 11–26 mm, bracts 2.8–6 × 0.3–0.8 mm, linear or narrowly lanceolate; calyx tube 0.5–0.8 mm long, with 1 to 3 colleters per sinus, lobes lanceolate, 3.3–5.6 × 1.2–1.8 mm, apex acute, green, with dense mixed indumentum outside, long trichomes 0.4–1.5 mm, glabrous inside; corolla briefly campanulate then rotate, olive green, yellow-green, green-brown, or orange-brown, abaxially with mixed indumentum or sometimes lacking glandular trichomes, adaxially hispidulose, trichomes translucent white, 0.1–0.2 mm, tube 1.7–2.3 mm long, lobes ovate, 5.9–8.4 × 3.4–4.2 mm, apex rounded and shallowly notched; gynostegium sessile, outer corona stipitate below, cupuliform above, stipe 0.6–0.8 mm long, obconic, with color and texture of corolla, upper part fleshy, glabrous, pentagonal in outline, 0.8–1 mm long, 0.3–0.6 mm thick, distal margin entire or weakly 2-tiered opposite anthers, deep purple-black, somewhat exceeding base of gynostegium, inner corona of 5 adnate ligules opposite outer corona lobes and anthers, linear with free truncate tips incumbent on backs of anthers, free tips 0.2–0.3 × 0.2 mm; anthers trapezoidal in outline, 0.5–0.6 × 0.8–0.9 mm, tilted under style apex, guide rails straight, parallel, tilted under style apex, ca. 0.1 mm long, terminal appendages appressed to style apex, 0.4 × 0.8–0.9 mm, white, corpusculum 0.21–0.26 × 0.09–0.13 mm, sagittate, red-brown, translators 0.15–0.19 × 0.1–0.14 mm, pollinia 0.39–0.44 × 0.24–0.28 mm, angularly and asymmetrically obovate, sterile at attachment; style apex 1.5–1.9 mm wide, slightly pentagonal, nearly round, flat or slightly concave, pink. Immature follicles divergent when double, fusiform, to 7 × 1.5 cm, green, with dense mixed indumentum, long trichomes 1–1.5 mm, apex long-attenuate, base stipitate with a flange at pedicel attachment, with scattered prickles (ca. 70 total), prickles ca. 12 mm long, 1 mm wide at middle; seeds unknown.

Matelea costaricensis is most closely related to *M. pinguifolia* (Standley) Woodson and *M. pseudobarbata* (Pittier) Woodson, but differs from those in lacking glandular trichomes on the upper leaf surface, in having larger flowers, the inside of the corolla hispidulous, and the outer corona more strongly pentagonal and nearly entire, lacking the distinct coronal layers of the related species.

Matelea costaricensis is known only from cloud forests in the mountains of central Costa Rica at 1500 to 2000 m elevation; flowers have been col-

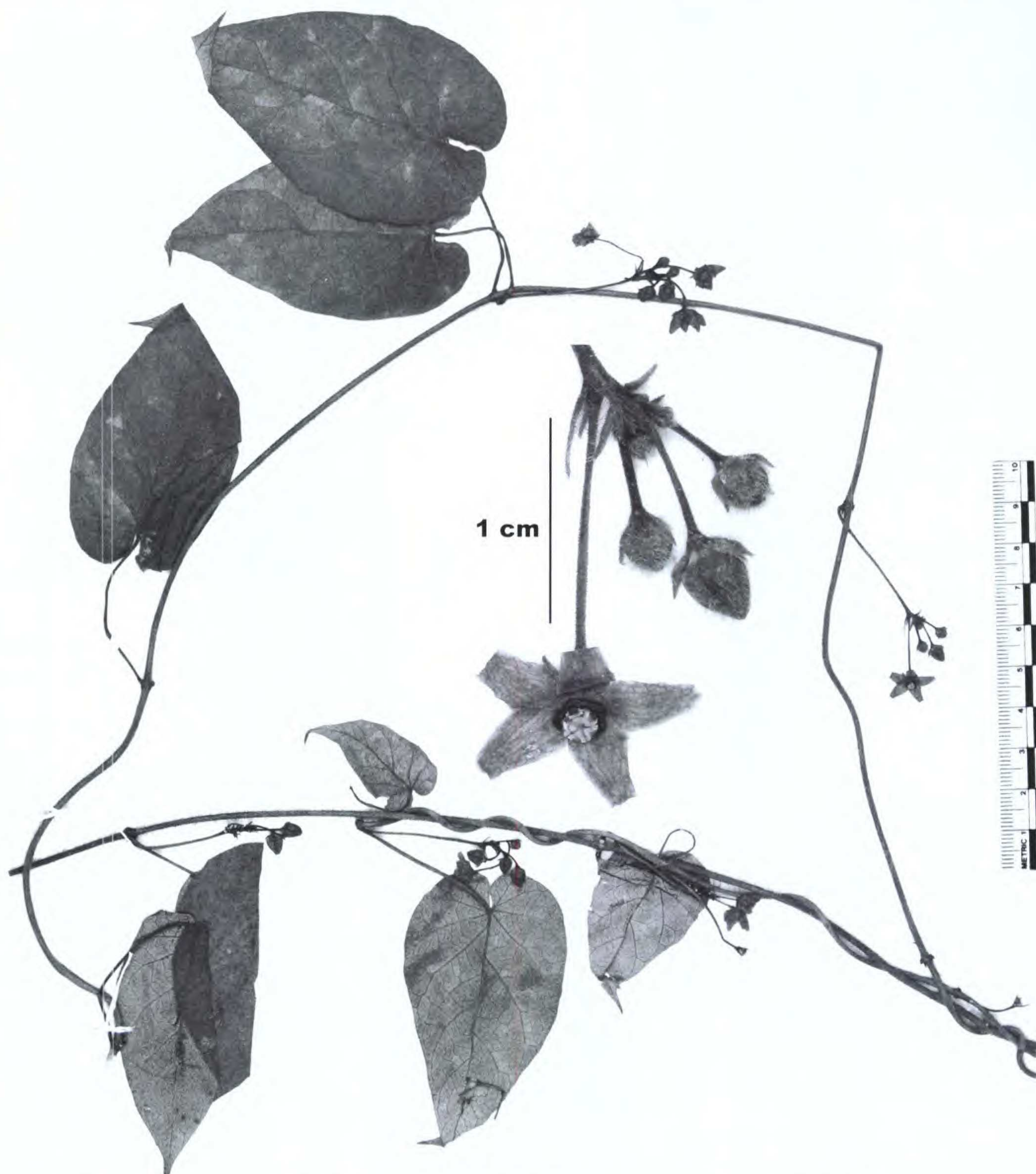


Figure 2. *Matelea costaricensis* W. D. Stevens. Scan of holotype specimen (Morales 4283, MO).

lected from April to November and immature fruits in November and December.

Paratypes. COSTA RICA. **Alajuela:** Zarcero, A. Smith 1352 (F), P1970 (MO), 2786 (F), A. Weston 3078 (MO). **San José:** Z.P. Cerros de Escazú, SE del Alto de Hierbabuena, J. Morales 1323 (MO).

Matelea emmartinezii W. D. Stevens, sp. nov.

TYPE: [cultivated at Missouri Botanical Garden from W. Stevens & E. Martínez S. 25819, Mexico, Chiapas: 2 km N of Naja, 860 m, 16°59'N, 91°36'W, 4 Sep. 1988], W. Stevens 25956 (holotype, MO). Figure 3.

Differt a *Matelea pusilliflora* et *M. ocellata* lobis corollarum cucullatis.

Vine, older stems woody and covered with thick, ridged, spongy, tan-colored cork, roots fibrous, latex white, young stems with a mixed indumentum, long trichomes in 2 lines, appressed, 0.3–0.7 mm, white with red septa, glandular trichomes 0.03–0.05 mm, pale red-brown, internodes 2–12 cm. Leaves opposite, blades ovate, 4–5.5 × 1.5–2 cm, apex attenuate, apiculate or not, base truncate or very shallowly cordate, pusticulate, adaxially glabrous except with sparse glandular trichomes on base of midrib, abaxially glabrous except with mixed in-

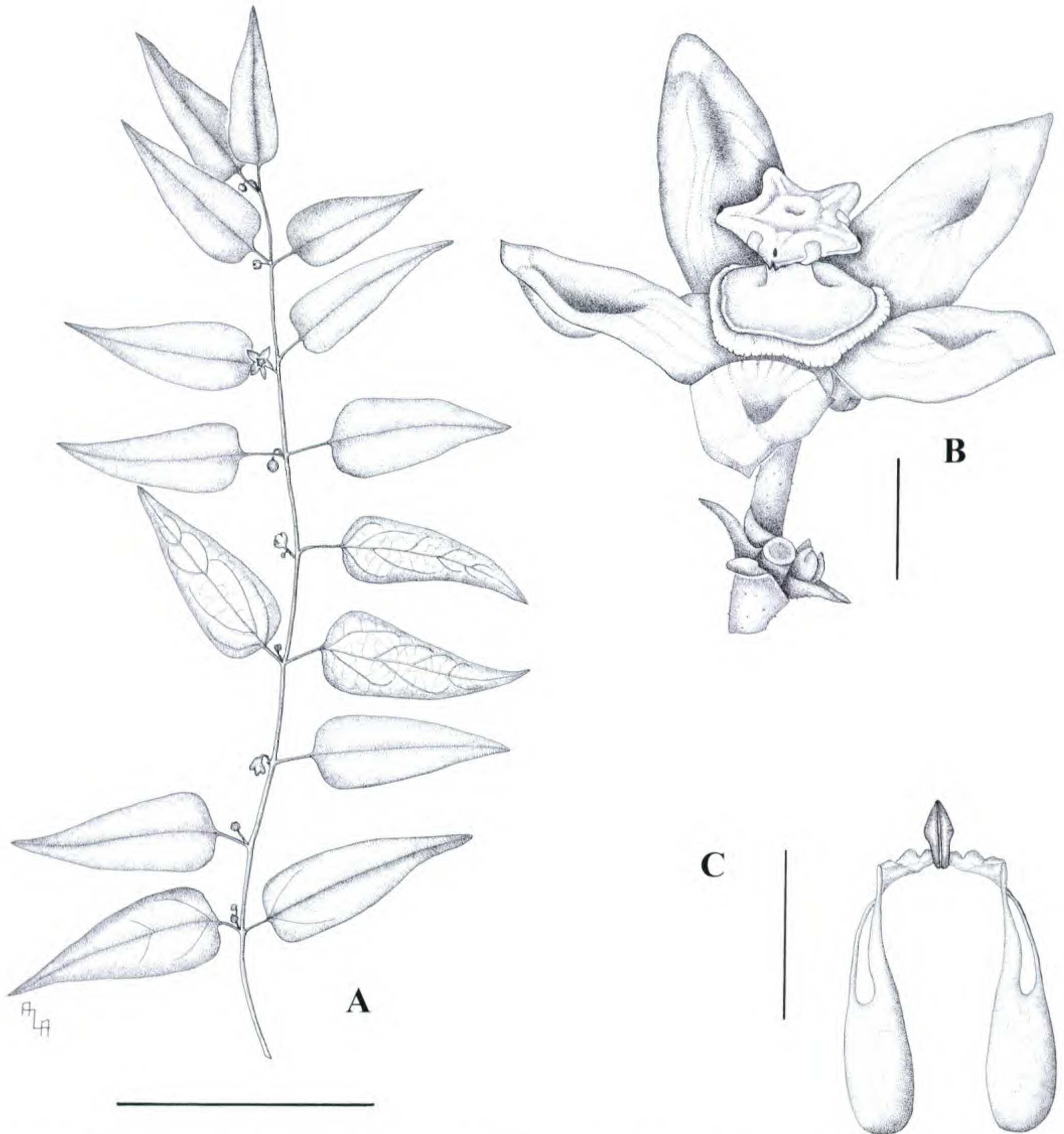


Figure 3. *Matelea emmartinezii* W. D. Stevens. —A. Flowering branch. —B. Flower. —C. Pollinarium. Drawn from the holotype, Stevens 25956 (MO).

dumentum on midrib and glandular trichomes on secondary veins, lateral veins 4 to 5 pairs, strongly curved, middle veins 40° – 45° to midrib, colleters 2 to 4; petiole 0.5–1 cm, with mixed indumentum or only glandular trichomes. Inflorescence congested-racemiform, peduncle 0.5–1 mm, glabrous, pedicel 2–2.5 mm, with sparse glandular trichomes, bracts 1–2.5 \times 0.2–0.4 mm, deltate to ligulate, glabrous, purple; calyx tube ca. 0.5 mm long, with 1 colleter per sinus, lobes elliptic, ca. 2.2 \times 0.9 mm, apex acute, purple, glabrous or with a few glandular trichomes on base outside; corolla rotate, green with dense brownish purple reticulations, with a bright white spot at tip of each corolla lobe within, adax-

ially glabrous, abaxially with short trichomes and glandular trichomes on the distal half of each lobe, tube 1–1.3 mm long, lobes elliptic, the center of each lobe cucullate, ca. 4 \times 2.7 mm, apex rounded and notched when flattened, patent; gynostegium with a cylindrical stipe ca. 0.7 mm long, outer corona a fleshy disk, ca. 1 mm wide, green and glistening above, base pentagonal in outline and overlapping corolla tube, margin dull, radially striate, purple, inner corona of 5 small lobes at apex of stipe, ca. 0.2 \times 0.3 mm, tips bilobulate and appressed to the bases of the anthers; anthers dorsoventrally flattened, ca. 0.4 \times 1.5 mm, guide rails straight, parallel, vertical, ca. 0.1 mm long, termi-

nal appendages appressed to margin of style apex, ca. 0.2 mm wide, white, corpusculum ca. 0.21×0.8 mm, sagittate, brown, translators ca. 0.19 mm long, pollinia ca. 0.81×0.24 mm, obovoid, sterile and excavated on proximal third near center; style apex ca. 2.3 mm wide, star-shaped, shallowly convex with a central depression. Follicles and seeds unknown.

This new species is most closely related to *Matelea pusilliflora* L. O. Williams and *M. ocellata* W. D. Stevens, which until now were the only mainland representatives of a small group of Caribbean species characterized by asymmetrical, narrowly 5-winged follicles, a corona in the form of a fleshy disk at the base of the gynostegium stipe, and a white, reflective eye at the tip of each corolla lobe. *Matelea emmartinezii* differs from both by having cucullate corolla lobes, by having an outer corona smooth and unadorned except striate on the outer margin, and by having a small but obvious inner corona. Additionally, *Matelea ocellata* has no pustulations on the leaves and longer inflorescences (peduncles 1–9 mm and pedicels 4–14 mm) and *M. pusilliflora* has smaller flowers (corolla lobes 2.3–2.7 mm long).

Matelea emmartinezii was collected in sterile condition in an opening in dry forest in Chiapas and later flowered in cultivation; it is known from no other collections.

***Matelea ferruginea* W. D. Stevens, sp. nov. TYPE:**

Guatemala. Chimaltenango: region of Los Positos, above Las Calderas, 2250–2400 m, 16 Dec. 1940, P. Standley 80219 (holotype, F; isotype, MO). Figure 4.

Mateleae magnifoliae affinis, sed differt gynostegio stipitato corona praelonga.

Large vine, older stems and base unknown, latex unknown, young stems with mixed indumentum, long trichomes moderately dense, 2–3 mm, straight, pale yellow-brown, spreading, short trichomes dense, 0.2–0.4 mm, straight, pale yellow-brown, glandular trichomes sparse to moderately dense, 0.2–0.4 mm, stalk pale yellow-brown, tips brown, hardly or not at all inflated, internodes 17–22 cm long. Leaves opposite, blades ovate to elliptic, 12–19 \times 8.7–14 cm, apex acuminate, base lobate, lobes descending to converging, sinus 1.7–2.5 cm deep, pilose, trichomes 0.5–1 mm, pale yellow-brown, lateral veins 6 to 8 pairs, middle veins 45°–50° to midrib, colleters 18 to 20; petiole 6.5–12.5 cm, with mixed indumentum. Inflorescence congested-racemiform, with mixed indumentum, pe-

duncle 55–135 mm, pedicel 18–20 mm, bracts to 11.5 \times 2.7 mm, elliptic, acuminate; calyx tube ca. 1 mm long, with 1 colleter per sinus, lobes elliptic to spatulate, unequal, flat or somewhat cucullate, 7.3–8.6 \times 5.4–6 mm, apex rounded, green, with dense, appressed, yellow-brown long trichomes outside, trichomes 0.5–1.5 mm, glabrous inside; corolla very briefly campanulate then rotate, yellowish green, reticulate when dried, with dense, appressed, yellow-brown long trichomes outside, trichomes 0.5–1 mm, glabrous inside, tube ca. 4.8 mm long, lobes broadly elliptic, somewhat asymmetric, 10.5–11.5 \times 8.6–9.5 mm, apex rounded and shallowly notched; gynostegium with stipe ca. 1.3 mm long, corona adnate to stipe, 5-lobed, fleshy, ca. 1.1 mm tall, 0.9 mm wide at the base, 0.6 mm wide at the top, star-shaped in outline at base and entirely under the gynostegium, dark-colored, stipe covered by the corona below, partially exposed above between the lobes, lobes truncate at tips and touching the anther bases; anthers rectangular in outline, ca. 0.5 \times 1.5 mm, guide rails rounded, parallel, vertical, ca. 0.2 mm long, terminal appendages appressed to margin of style apex, ca. 0.1 \times 1.2 mm, white, corpusculum ca. 0.19 \times 0.10 mm, sagittate, red-brown, translators ca. 0.23 \times 0.15 mm, straight, pollinia ca. 0.70 \times 0.29 mm, obovate, sterile and excavated on proximal third; style apex ca. 2.2 mm wide, pentagonal, flat with a slight umbo in center. Follicles and seeds unknown.

Matelea ferruginea is superficially similar to *Matelea velutina* (Schlechtendal) Woodson, from northeastern Mexico, and the original collection had been so determined. This new species, however, is probably more closely related to the also rather similar, and generally sympatric, *Matelea magnifolia* (Pittier) Woodson. *Matelea velutina* shares with the new species a vertically oriented corona surrounding the gynostegium stipe, but the lobes of the outer corona are broad, tangentially oriented and covering the entire stipe, concave, yellow and glistening, rather than narrow, radially compressed and broadest at the base, attenuate above and not completely covering the stipe, dark-colored and dull. The corona of *Matelea velutina* is similar to that of the smaller-flowered *M. reticulata* (Engelmann ex A. Gray) Woodson, from southwestern U.S.A. and adjacent Mexico, and both species have the terminal anther appendages bright, reflective white and covering the entire style apex, forming a distinctive eye in the center of the flower. In contrast, *Matelea magnifolia* and *M. ferruginea* have terminal anther appendages covering only the margin of the style apex and have no re-

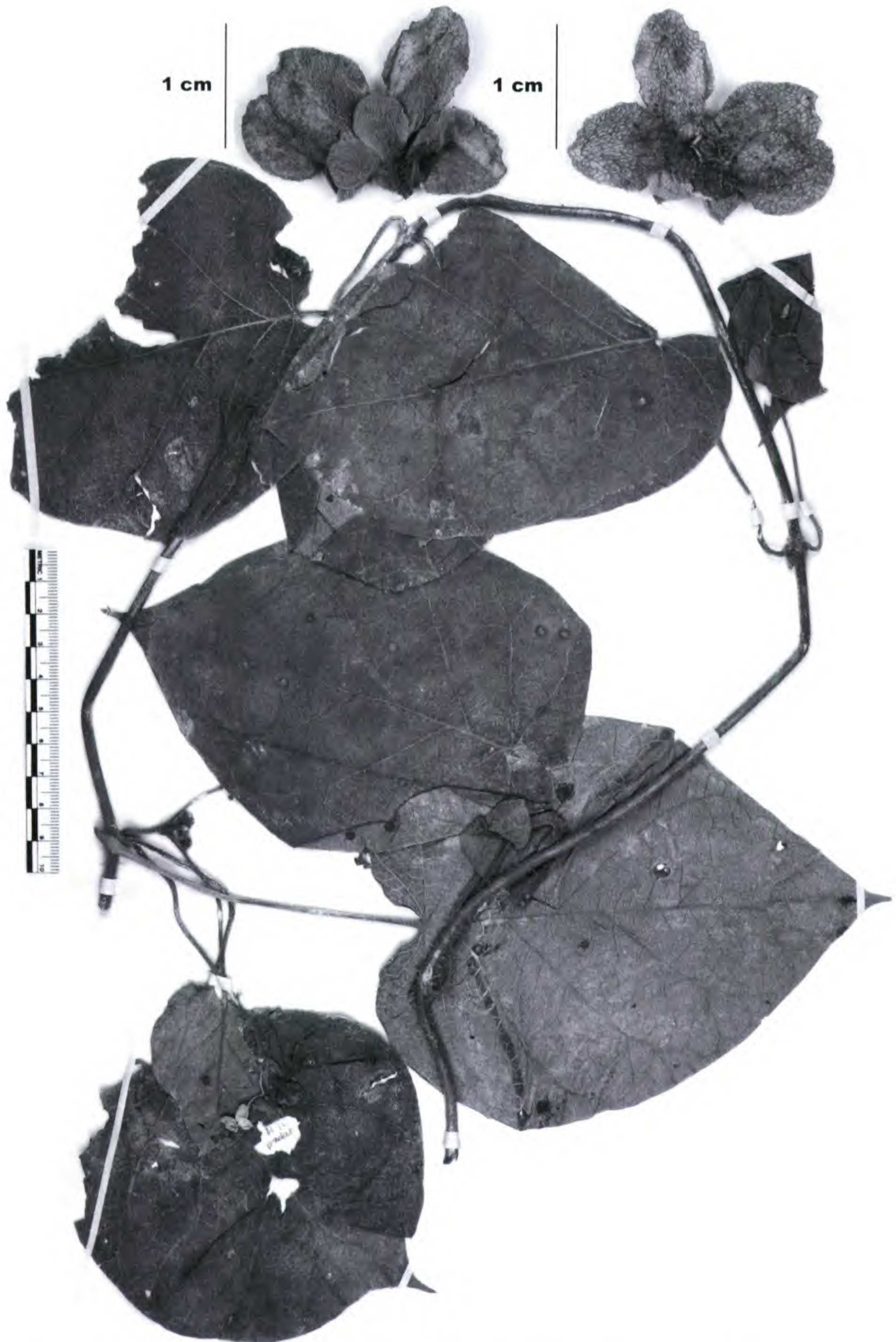


Figure 4. *Matelea ferruginea* W. D. Stevens. Scan of holotype specimen (Standley 80219, F).

flective eye; they also share, along with *M. velutinoides*, described below, relatively long glandular trichomes with the terminal cell darker colored but hardly inflated. *Matelea magnifolia* is easily distinguished by having a faucal annulus, an essentially

sessile gynostegium and a horizontally oriented, disk-like corona.

Although the Johnston collection is technically a paratype, it was collected at the same place and on the same date as the type collection and may be

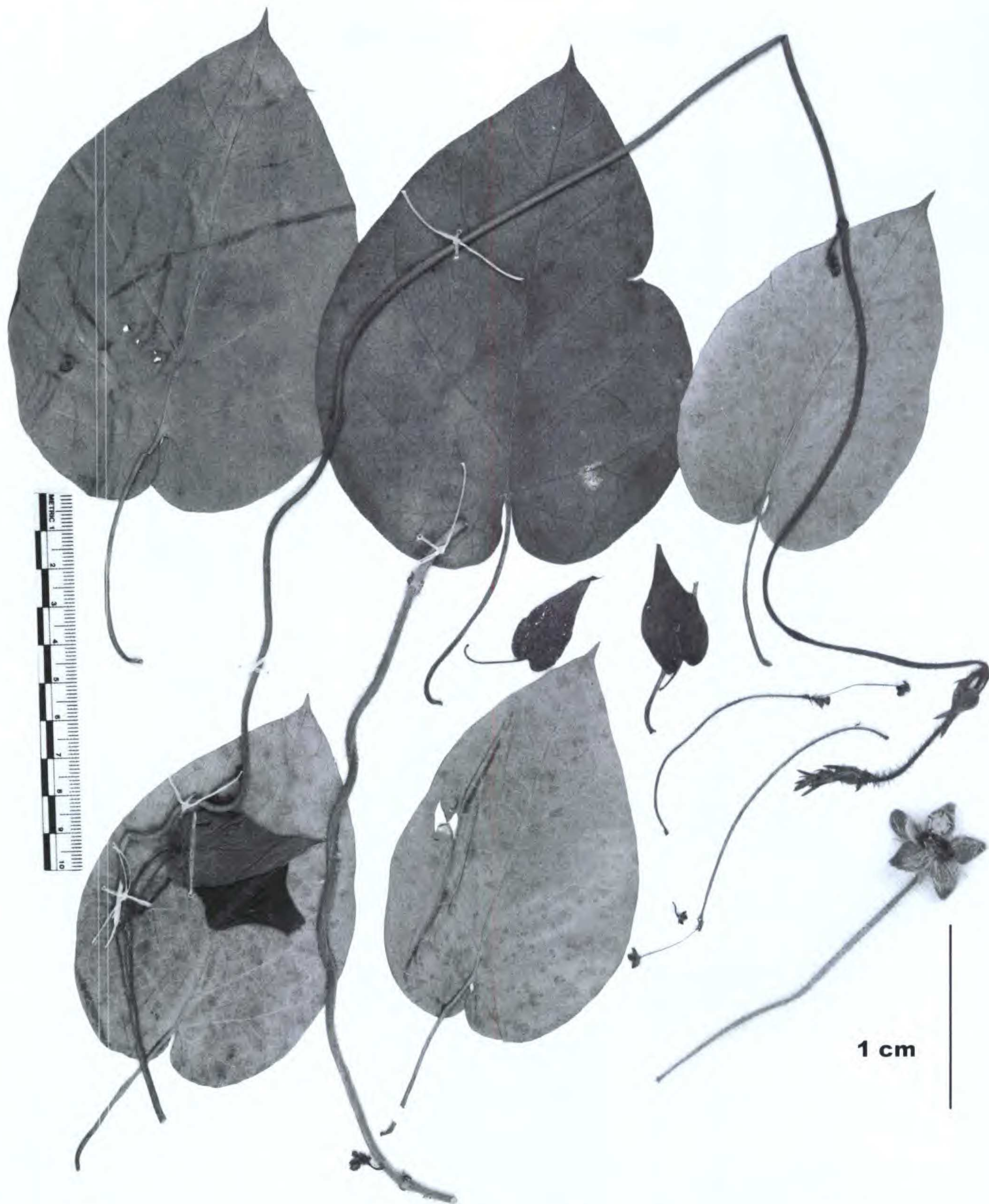


Figure 5. *Matelea filipes* W. D. Stevens & Monterrosa. Scan of holotype specimen (Sandoval 1608, MO).

part of the original gathering; this species has not been collected in 65 years.

Paratype. GUATEMALA. **Chimaltenango:** Calderas, J. Johnston 1792 (F).

Matelea filipes W. D. Stevens & Monterrosa, sp. nov. TYPE: El Salvador. Achuachapán: San Francisco Menéndez, cabecera de la vereda La Pinera, 650 m, 13°49'N, 89°56'W, 6 June 1997, E. Sandoval 1608 (holotype, MO; isotype, LAGU). Figure 5.

Mateleae pinguifoliae et *M. pseudobarbatae* affinis, sed differt ramis inflorescentiae delicatioribus floribus minoribus.

Vine, older stems and base unknown, latex unknown, young stems with mixed indumentum, long trichomes sparse to dense, 1.5–3.5 mm, straight, pale yellow-brown, spreading, short trichomes dense, 0.1–0.15 mm, straight, translucent, glandular trichomes dense, 0.07–0.1 mm, dark brown, internodes 15–20 cm. Leaves opposite, blades ovate,

10.2–14.2 × 6.2–10.8 cm, apex abruptly acuminate, base lobate, lobes convergent to overlapping, sinus 1–2 cm deep, adaxially with mixed indumentum, glandular trichomes sparse, abaxially with dense short and glandular trichomes, lateral veins 6 to 7 pairs, middle veins 40°–45° to midrib, colleters 7 to 10; petiole 5.8–7 cm, with mixed indumentum. Inflorescence congested-racemiform, thin, with mixed indumentum, peduncle 45–77 mm, axis to 5 mm, pedicel 17–24 mm, bracts 1–1.5 × 0.1–0.2 mm, linear; calyx tube ca. 0.5 mm long, with 1 colleter per sinus, lobes lanceolate, ca. 2.2 × 1.2 mm, apex acute, green, with mixed indumentum outside, long trichomes 0.5–1 mm, glabrous inside; corolla briefly campanulate, then rotate, pale brown, with mixed indumentum outside, long trichomes 0.5–1 mm, inside with flexuous, pale yellow trichomes 2–3 mm long, tube ca. 1 mm long, lobes broadly ovate, ca. 2.7 × 2.3 mm, apex rounded and notched, patent; gynostegium sessile, outer corona obconic, circular in outline, glabrous, undulate and darker-colored on distal margin in 2 rings opposite anthers and 1 ring alternate with anthers, margin equaling base of gynostegium, ca. 0.6 mm tall, inner corona of 5 adnate ligules opposite anthers, trapezoidal in outline, lateral margins raised, ca. 0.6 × 0.5 mm, distal margin similar to margin of outer corona, producing 3 layers opposite anthers; anthers trapezoidal in outline, ca. 0.4 × 0.9 mm, tilted under style apex, guide rails straight, parallel, tilted under style apex, ca. 0.1 mm long, terminal appendages appressed to style apex, ca. 0.3 × 0.7 mm, white to translucent, corpusculum ca. 0.19 × 0.11 mm, sagittate, red-brown, translators ca. 0.11 × 0.11 mm, straight, pollinia ca. 0.41 × 0.29 mm, angularly obovate, sterile and excavated at attachment; style apex ca. 1.3 mm wide, slightly pentagonal, nearly round, flat. Follicles and seeds unknown.

Matelea filipes is most closely related to *M. pinguifolia*, from Panama and northern South America, and *M. pseudobarbata*, a rare species endemic to central Costa Rica, with which it shares relatively thin inflorescence branches, relatively small flowers, and a peculiar long, wavy indumentum on the inside of the corolla, although the inflorescence of *M. filipes* is longer (peduncles 45–77 mm vs. 5–25 mm) and even more delicate (pedicels 0.3 mm diam. vs. 0.5–0.7 mm diam.) and the flowers are smaller (calyx lobes 2.2 mm long vs. 2.5–4.1 mm long) than the other two species. Additionally, *Matelea pinguifolia* and *M. pseudobarbata* have a stipitate gynostegium and a more massive, stipitate, and more strongly colored corona, contrasting

sharply with the reflexed corolla of this new species. *Matelea haberi* is also similar, and has a sessile gynostegium, but has stouter inflorescences, larger flowers (corolla lobes 3.9–4.8 mm long), and a more dissected corona margin.

Matelea filipes is known only from the type collection from El Salvador. The isotype was studied by the coauthor of the species, Jorge Alberto Monterrosa Salomón.

Matelea gentlei (Lundell & Standley) Woodson, Ann. Missouri Bot. Gard. 28: 234. 1941. Basionym: *Vincetoxicum gentlei* Lundell & Standley, in Standley, Field Mus. Nat. Hist., Bot. Ser. 17: 269. 1937. TYPE: Belize. Belize: Gracie Rock, Sibun River, 31 Jan. 1936, *P. Gentle 1779* (lectotype, designated here, MICH; duplicates of lectotype, A, F, MO, P, US).

The original diagnosis of *Vincetoxicum gentlei* cited "*Lundell*" 1779 and 1780 as the types. Lundell (1938) corrected the collector of the types to *Gentle*. The lectotype is a flowering specimen and the unselected syntype, *P. Gentle 1780* (F, MICH, WIS), has young fruits.

Matelea haberi W. D. Stevens, sp. nov. TYPE: Costa Rica. Puntarenas: Monteverde, Río Guacimal valley, 800 m, 6 Oct. 1984, *W. Haber 650* (holotype, MO). Figure 6.

Mateleae pinguifoliae et *M. pseudobarbatae* affinis, sed statim differt corolla intra glabra.

Vine, older stems and base unknown, latex white, young stems with mixed indumentum, long trichomes sparse to dense, 1.5–3.2 mm, straight, pale yellow, spreading, short trichomes dense, 0.07–0.13 mm, straight, translucent, glandular trichomes sparse to moderately dense, 0.1–0.15 mm, brown to nearly black, internodes 11–30 cm. Leaves opposite, blades ovate to elliptic, 6.2–13 × 3.4–8.6 cm, apex abruptly acuminate, base lobate, lobes descending to overlapping, sinus 0.7–2.4 cm deep, adaxially with dense short trichomes, sometimes with sparse glandular and long trichomes on veins and at base, abaxially with dense short and glandular trichomes, lateral veins 5 to 7 pairs, middle veins 35°–40° to midrib, colleters 6 to 10; petiole 2.4–5.7 cm, with dense short and glandular trichomes, often with sparse to moderately dense long trichomes. Inflorescence racemiform or congested-racemiform, with dense short and glandular trichomes and sparse to dense long trichomes, peduncle 8–25 mm, axis to 10 mm, pedicel 6–14 mm, first bract 5.5–6.8 × 0.3–1 mm, linear, upper bracts 1.7–3.5 × 0.2–0.7 mm; calyx tube 0.3–0.5

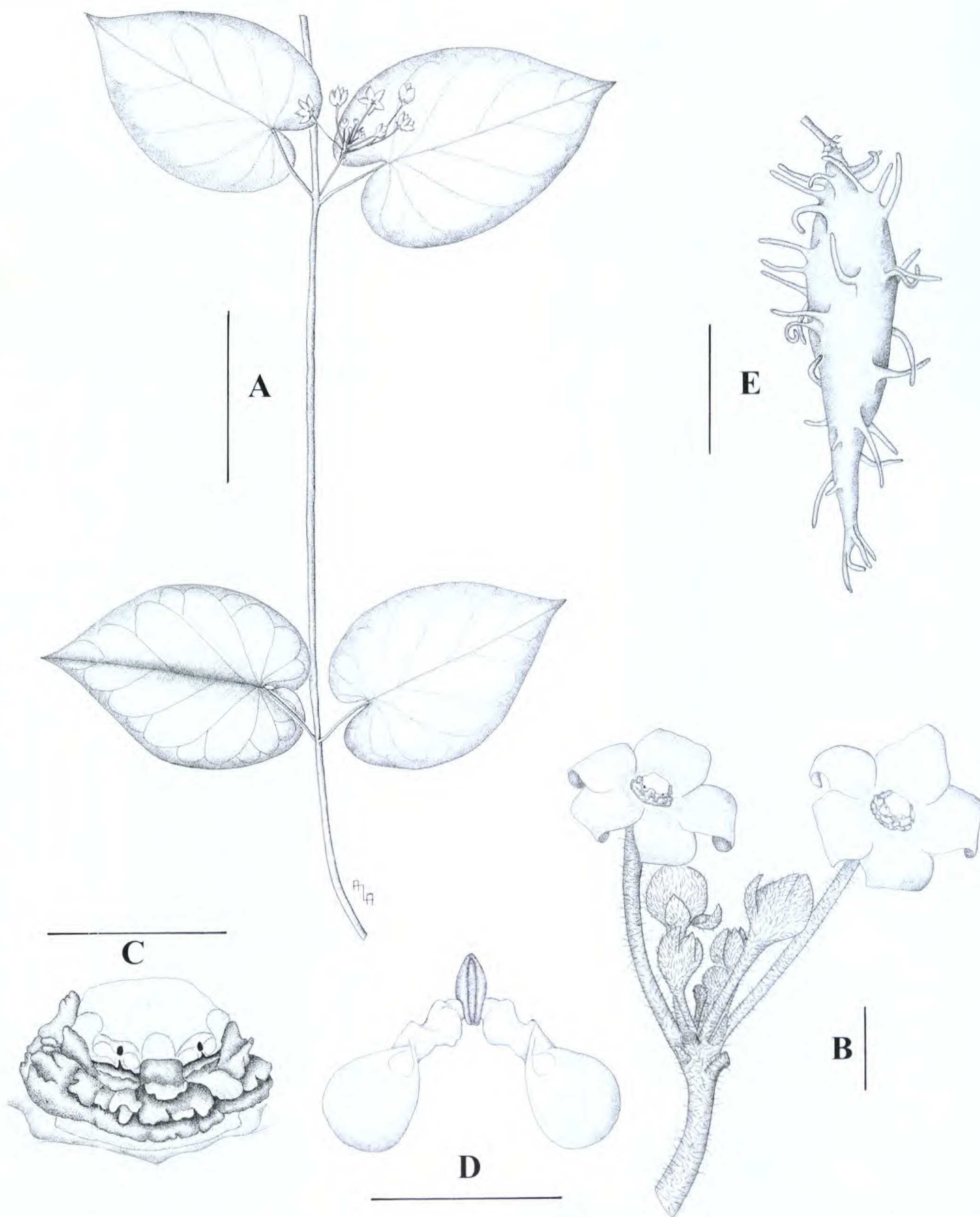


Figure 6. *Matelea haberi* W. D. Stevens. —A. Flowering branch. —B. Inflorescence. —C. Corona and gynostegium. —D. Pollinarium. —E. Nearly mature follicle. A–C drawn from *Espinoza 607* (MO), D drawn from *Haber 199* (MO), E drawn from *Rivera 947* (MO).

mm long, with 1 to 3 colleters per sinus, lobes lanceolate, $2.1\text{--}3.1 \times 1.1\text{--}1.8$ mm, apex acute, green, with dense mixed indumentum outside, long trichomes $0.5\text{--}1.5$ mm, glabrous inside; corolla rotate-reflexed, orange to dark reddish brown, tube $1\text{--}1.5$ mm long, with mixed indumentum outside, glabrous inside, lobes broadly ovate, $3.9\text{--}4.8 \times 2.8\text{--}3.8$ mm, apex rounded and shallowly notched,

with dense short and glandular trichomes and sparse to dense long trichomes $0.5\text{--}0.7$ mm long outside, glabrous inside; gynostegium with stipe $0.3\text{--}0.4$ mm long, outer corona short-stipitate below, cupuliform above, stipe $0.1\text{--}0.2$ mm long, cylindrical, with color and texture of corolla, upper part fleshy, glabrous, irregularly divided on outer surface in 2 rings, deep purple, slightly 5-lobed at

base, somewhat shorter than style apex, tube 0.3–0.6 mm long, lobes 0.1–0.2 × 0.3–0.5 mm, inner corona of 5 adnate ligules opposite outer corona lobes and anthers, linear with free truncate or slightly bifid tips incumbent on backs of anthers, free tips 0.3–0.5 × 0.3–0.4 mm; anthers trapezoidal in outline, 0.4–0.5 × 0.8–0.9 mm, tilted under style apex, guide rails straight, parallel, tilted under style apex, ca. 0.1 mm long, terminal appendages appressed to style apex, 0.3–0.4 × 0.7–0.8 mm, white to translucent, corpusculum 0.15–0.2 × 0.07–0.09 mm, sagittate, pale brown, translators 0.1–0.15 × 0.07–0.1 mm, sigmoid, pollinia 0.27–0.35 × 0.22–0.25 mm, asymmetrically obovate, sterile and excavated at attachment; style apex 0.9–1.2 mm wide, slightly pentagonal, nearly round, flat or slightly concave, apparently purple. Follicles divergent when double, fusiform, 8–9 × 1.7–2 cm, green, with dense mixed indumentum, long trichomes to 2 mm long, sometimes sparse, apex long-attenuate, base stipitate, with scattered prickles (1 to 3 per cm², 40 to 50 total), prickles 11–17 mm long, 0.8–1.3 mm wide at middle, tips often clavate, bifid or geniculate; seeds obovate, 7–7.7 × 4.8–4.9 mm, yellow-brown, margin 0.6–0.7 mm wide, irregularly crenate on distal third to two-thirds, surface slightly reticulate-rugose, coma 2.5–3 cm long, white.

Matelea haberi is most closely related to *M. pinguifolia*, *M. pseudobarbata*, and *M. filipes*, but differs most conspicuously in having the inside of the corolla glabrous; it also has denser inflorescences, a more prominently lobed corona, and smaller pollinia (0.27–0.35 × 0.22–0.25 mm vs. 0.40–0.53 × 0.28–0.30 mm) and style apices (0.9–1.2 mm vs. 1.7–2.5 mm). The follicles of *Matelea haberi* have longer prickles (11–17 mm vs. 7–11 mm) and shorter trichomes (to 2.0 mm vs. to 3.5 mm) than those of *M. pinguifolia* and *M. pseudobarbata*.

Matelea haberi is known only from cloud forests in the volcanic mountains of northwestern Costa Rica at 760 to 1550 m elevation, and it flowers and fruits from July to January.

Paratypes. COSTA RICA. **Guanacaste:** P.N. Rincón de la Vieja, Est. Las Pailas, *R. Espinoza* 607 (CR, INB, MO), *D. García* 36 (MO); Monteverde, *A. Gentry*, *W. Haber*, *L. Woodruff* & *B. Boyle* 71600 (MO); P.N. Rincón de la Vieja, Hda. Sta. María, *J. Gómez* *L. 10312* (F); P.N. Rincón de la Vieja, sector Los Naranjos, camino a San Jorge, *G. Rivera* 947 (MO). **Puntarenas:** Monteverde, *W. Haber* 199 (MO), 581 (MO).

Matelea insolita W. D. Stevens, sp. nov. TYPE: Nicaragua. Estelí: Reserva Natural Miraflores, Comarca Sontule, 1000–1100 m, 13°12'N, 86°20'W, 7 July 1999, *R. Rueda*, *I. Coronado*, *W. Velásquez* & *M. Arroliga* 11427 (holotype, MO; isotype, HULE). Figure 7.

Ex affinitate *Mateleae pinguifoliae* et specierum affinium corona externa tenui alba quam corona interna breviori confestim distinguenda.

Vine, older stems and base unknown, latex unknown, young stems with mixed indumentum, long trichomes sparse, 0.4–2 mm, straight, yellow-brown, spreading, short trichomes dense, 0.1–0.2 mm, straight, white, glandular trichomes dense, ca. 0.1 mm, dark brown, internodes 10–16 cm. Leaves opposite, blades ovate, 6.8–12.1 × 3.6–7 cm, apex abruptly acuminate to attenuate, base lobate, lobes descending to convergent, sinus 0.6–1.6 cm deep, adaxially with dense short trichomes and a few glandular trichomes at base of midrib, abaxially with dense short and glandular trichomes, lateral veins 5 to 7 pairs, middle veins 35°–45° to midrib, colleters 10 to 20; petiole 3.6–6.9 cm, with dense short and glandular trichomes. Inflorescence congested-racemiform, with mixed indumentum, long trichomes sparse, peduncle 10–25 mm, axis to 5 mm, pedicel 15–35 mm, bracts 1.5–1.8 × 0.3–0.4 mm, linear or narrowly lanceolate; calyx tube 0.5–0.8 mm long, with 1 colleter per sinus, lobes lanceolate, 3.1–3.5 × 1.2–1.3 mm, apex acute, green, with mixed indumentum outside, long trichomes sparse, 0.3–0.5 mm, glabrous inside or hispidulose at tip; corolla briefly campanulate, then rotate, yellowish, with mixed indumentum outside, long trichomes sparse, 0.3–0.8 mm, inside with flexuous, white trichomes 0.8–1.2 mm long in tube and base of lobes, tube ca. 2.5 mm long, lobes lanceolate, 5.7–6.5 × 3.5–3.6 mm, apex rounded and notched, patent; gynostegium sessile, outer corona laminar, flat, horizontal, dull white, 5-lobed, entirely hidden under gynostegium, tube ca. 0.2 mm long, lobes ca. 0.4 × 0.9 mm, irregularly toothed, inner corona of 5 adnate ligules opposite anthers, rectangular in outline, fleshy, purple-black, ca. 0.8 × 0.6 mm, tips bifid and appressed to anther backs; anthers elliptic in outline, ca. 0.5 × 1.1 mm, guide rails straight, parallel, slightly tilted under style apex, ca. 0.1 mm long, terminal appendages appressed to margin of style apex, ovate, ca. 0.3 × 0.8 mm, translucent, corpusculum ca. 0.18 × 0.08 mm, sagittate, red-brown, translators ca. 0.11 × 0.09 mm, straight, pollinia ca. 0.35 × 0.16 mm, asymmetrically obovate, sterile and excavated on proximal two-thirds; style apex ca. 1.4 mm wide, slightly

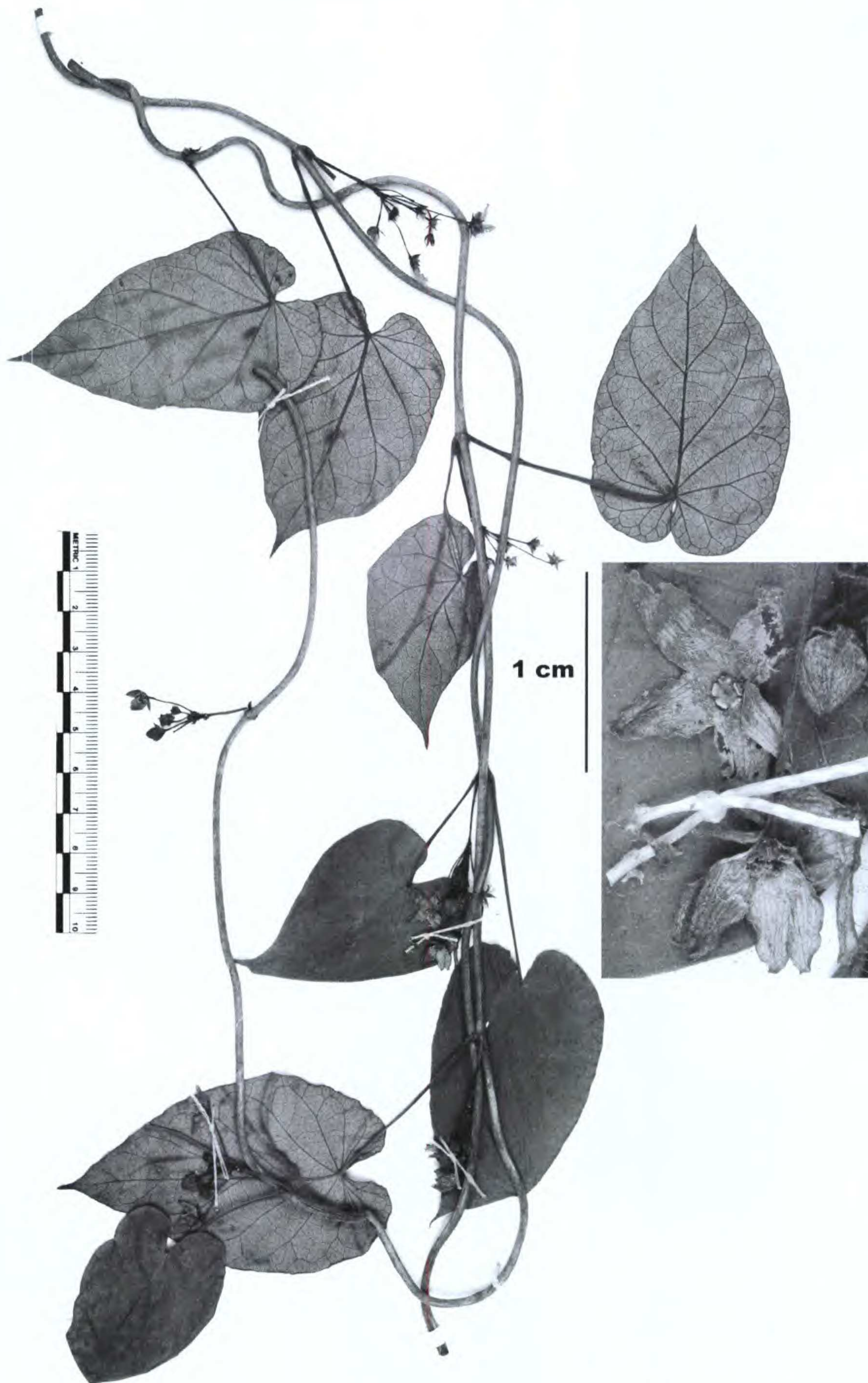


Figure 7. *Matelea insolita* W. D. Stevens. Scan of holotype specimen (Rueda *et al.* 11427, MO).

pentagonal, nearly round, shallowly concave. Immature follicles fusiform, to 13.5×2.5 cm, green, with dense short and glandular trichomes, apex long-attenuate, base stipitate, with more or less dense prickles (ca. 4 per cm^2 , ca. 150 total), prick-

les 20–30 mm long, 0.6–1.2 mm wide at middle, tips sometimes slightly clavate; seeds unknown.

Matelea insolita is clearly of the *M. pinguifolia* alliance, which shares nearly symmetrical fusiform

follicles that have relatively sparse long, thin, curved prickles and a dense mixed indumentum, and which ranges from Mesoamerica to northern South America. *Matelea insolita* is vegetatively quite similar to *M. pinguifolia*, but is the only species of the alliance, and perhaps in the whole genus, where the outer corona is white and practically vestigial and the inner corona is prominent. *Matelea insolita* has only been found in northern Nicaragua, between 900 and 1100 m elevation. The flowers were collected in July and the nearly mature fruits in January.

Paratype. NICARAGUA. **Jinotega:** R.N. Kilambé, Santa Teresa de Kilambé, R. Rueda, D. Paguaga, H. Mendoza, A. Rivera, N. Toval & M. Garmendia 15591 (HULE, MO).

Matelea velutinoides W. D. Stevens, sp. nov.

TYPE: Mexico. Chiapas: Mpio. Cintalapa, SE of Cerro Baul on border with Oaxaca, 16 km NW of Rizo de Oro along logging road to Colonia Figaroa, 1600 m, 6 Sep. 1972, D. Breedlove 27642 (holotype, MO). Figure 8.

Matelea velutinae affinis, sed lobis coronae radiantibus lobis corollae intra ad marginem hispidulosis distinguenda.

Vine, older stems and base unknown, latex white, young stems with mixed indumentum, long trichomes sparse to dense, 1.5–2.5 mm, straight, yellow to brown, spreading, short trichomes dense, 0.2–0.5 mm, straight, yellow to brown, glandular trichomes dense, 0.2–0.5 mm, stalks pale brown, tips black-brown, hardly or not at all inflated, internodes 12–20 cm. Leaves opposite, blades ovate to elliptic, 9.8–13.8 × 4.8–7.2 cm, apex acuminate, base lobate, lobes descending to overlapping, sinus 0.7–1.3 cm deep, adaxially hispid, trichomes 0.5–1.5 mm, pale brown, short and glandular trichomes present on midrib, abaxially hispid, trichomes 0.5–1.5 mm, short and glandular trichomes present on veins and sometimes on surface, lateral veins 6 to 8 pairs, middle veins 35°–45° to midrib, colleters 10 to 24, thin, with light colored tips; petiole 3.7–5.5 cm, with mixed indumentum. Inflorescence racemiform or congested-racemiform, with mixed indumentum, peduncle 35–95 mm, axis to 11 mm, pedicel 9–24 mm, bracts to 9 × 2 mm, lanceolate; calyx tube 0.5–1 mm long, with 1 colleter per sinus, lobes elliptic, unequal, flat or somewhat cucullate, 4.3–6 × 2.3–4 mm, apex rounded to acuminate, green, with mixed indumentum outside, long trichomes 1–2.5 mm, sometimes restricted to distal half, glabrous inside or with scattered glandular trichomes; corolla very briefly campanu-

late then rotate, brown to yellowish orange, reticulate when dried, with mixed indumentum outside, long trichomes 0.5–1 mm, glabrous inside except inconspicuously hispidulose in a narrow band along l margin of each lobe, sometimes extending into tube, trichomes 0.05–0.1 mm, translucent, tube 3.2–3.6 mm long, lobes broadly elliptic, somewhat asymmetric, 6.2–7.1 × 5.7–7.4 mm, apex rounded and shallowly notched; gynostegium with stipe 0.9–1.1 mm long, outer corona entire or shallowly 5-lobed at base, base horizontal and overlapping the corolla, erect above and entirely enclosing gynostegium stipe, fleshy, with radial crests, 0.8–1.2 mm tall, 0.7–1.1 mm wide at the base, dark-colored, inner corona borne on outer corona, erect, forming radial wings on upper part of outer corona, lighter-colored, 0.5–0.6 × 0.3–0.4 mm, tips touching the anther bases; anthers rectangular in outline, 0.5–0.7 × 1.4–1.5 mm, guide rails rounded, parallel, somewhat tilted under style apex, 0.15–0.2 mm long, terminal appendages appressed to style apex and covering about half of surface, 0.5–0.8 × 1–1.4 mm, white, corpusculum 0.23–0.25 × 0.09 mm, sagittate, red-brown, translators 0.19–0.25 × 0.14–0.15 mm, straight, pollinia 0.65–0.69 × 0.25–0.29 mm, obovate, sterile and excavated in proximal third; style apex 2.1–2.6 mm wide, pentagonal, flat or slightly concave when dry, with a slight umbo in center. Follicles and seeds unknown.

Matelea velutinoides is superficially similar to *Matelea velutina*, from northeastern Mexico, and most of the collections were distributed under this name. *Matelea velutinoides* has the corona oriented horizontally below and vertically above, but the vertical part is dark-colored and radially oriented, rather than yellow and tangentially oriented, as in *M. velutina*. *Matelea velutina* also has larger (to 15.1 × 11 cm vs. to 13.8 × 7.2 cm) and proportionately broader leaves, larger flowers (corolla lobes 7.1–10.0 mm long vs. 6.2–7.1 mm long), corollas that are entirely glabrous within, and terminal anther appendages that entirely cover the style apex. *Matelea velutinoides* differs from *M. ferruginea* in having a spreading, mixed indumentum on the outside of the calyx and corolla, rather than a simple appressed indumentum, and in the corona covering the entire gynostegium stipe.

Matelea velutinoides is known from cloud forest in Chiapas and Guatemala between 1600 and 2200 m elevation and is known to flower between April and September.

Paratypes. MEXICO. **Chiapas:** Mpio. Motozintla, 15 km al O de Motozintla, camino a Siltepec, E. Martínez S.



Figure 8. *Matelea velutinoides* W. D. Stevens. Scan of holotype specimen (Breedlove 27642, MO).

et al. 20741 (MO); Carelas, *E. Matuda* 15517 (F); Mpio. Escuintla, Cacaluta, *E. Matuda* 17001 (F, MEXU); Mpio. Siltepec, Cascada, *E. Matuda* 17842 (F); Cerro del Bqueron, *C. Purpus* 7277-B (F); Mpio. Motozintla, El Rosario, *E. Ventura & E. López* 3935 (F). GUATEMALA. **El Quiché:** falls of Río de las Violetas, 2.5 mi. N of Nejab, *G. Proctor* 25445 (CAS, F, TEX).

Pherotrichis schaffneri A. Gray, *Syn. Fl. N. Amer.* (ed. 2) 2(1): 462. 1886. TYPE: Mexico. "Northern Mexico," *J. Schaffner* 63 (lectotype, designated here, GH; duplicate of lectotype, K).

Gray (1886a) validly, but minimally, published

Pherotrichis balbisii (see below) and *P. schaffneri*, where he cites the earlier written, but later published, fuller treatment (Gray, 1886b). Gray intentionally and specifically placed one syntype of *Gonolobus pogonanthus* (see below) (Ghiesbreght 670) in his *Pherotrichis balbisii* and the other (Parry & Palmer 586) in his *P. schaffneri*, thereby effectively lectotypifying the Hemsley name with the Ghiesbreght specimen and placing it in synonymy of his superfluous *P. balbisii* (= *P. villosa* (Schultes) Meisner). The unselected syntypes of *Pherotrichis schaffneri* are: *C. Parry & E. Palmer 586* (syntype, GH; isosyntypes, K, MO) and *J. Lemmon 2816* (syntype, GH). *Pherotrichis schaffneri* is almost certainly a species distinct from *P. villosa* (Schultes) Meisner and the lectotypification stabilizes that usage.

Pherotrichis villosa (Schultes) Meisner, *Pl. Vasc. Gen.* 2: 176. 1840. *Cynanchum villosum* Schultes, in Roemer & Schultes, *Syst. Veg.* 6: 103. 1820, based on *Asclepias villosa* Balbis, *Mem. Acad. Sci. Turin, Sci. Phys.* 7: 331, t. 4. 1803–4, not *A. villosa* P. Miller, 1768. TYPE: unknown provenance cultivated at the Turin botanical garden, *G. Balbis s.n.* (holotype, TO, not seen; isotypes: G, MO).

Gonolobus pogonanthus Hemsley, *Biol. Cent.-Amer., Bot.* 2(11): 333. 1882. TYPE: Mexico. Chiapas, 1864–1870, *A. Ghiesbreght 670* (lectotype, designated by Gray, *Proc. Amer. Acad. Arts* 21: 400. 1886, K; duplicate of lectotype, GH).

Pherotrichis Decaisne was validly published (Decaisne, 1838), but the combination based on the only included species, *Asclepias villosa* Balbis, now known to be a later homonym of *A. villosa* P. Miller, was not made. Later, Decaisne (1844) included *Pherotrichis* in his concept of *Lachnostoma* and published the name *L. balbisii* Decaisne (in A. de Candolle, *Prodr.* 8: 602. 1844), a superfluous name based on *Asclepias villosa* Balbis. The names *Pherotrichis villosa* (Schultes) K. Schumann (in Engler & Prantl, *Nat. Pflanzenfam.* 4(2): 303. 1895), *P. balbisii* A. Gray (*Syn. Fl. N. Amer.* (ed. 2) 2(1): 462. 1886), and *Matelea balbisii* Woodson (*Ann. Missouri Bot. Gard.* 28: 231. 1941) are likewise based on *Asclepias villosa* Balbis and superfluous. The species has generally been treated as *Matelea balbisii* (Standley & Williams, 1969; Breedlove, 1986) and *Pherotrichis balbisii* (Stevens, 2001), but the overlooked *Pherotrichis villosa* (Schultes) Meisner must be used for the species when placed in the genus *Pherotrichis*. *Asclepias villosa* Balbis was described from material of unknown provenance cultivated at the Turin botanical garden and specimens appar-

ently distributed by Balbis (e.g., a specimen at G: “misit Balbis 1805, non indigena pedem., in ho. T culta”) are taken to be type material.

Polystemma guatemalense (Schlechter) W. D. Stevens, comb. nov. Basionym: *Labidostelma guatemalense* Schlechter, in Loesner, *Bull. Herb. Boissier, sér. 2, 6*: 843. 1906. TYPE: Guatemala. Huehuetenango: Nentón, Sep. 1887, *C. Seler & E. Seler 3279* (lectotype, designated here, F).

Vincetoxicum quirosii Standley, *Publ. Field Mus. Nat. Hist., Bot. Ser.* 18: 959. 1938. Syn. nov. *Matelea quirosii* (Standley) Woodson, *Ann. Missouri Bot. Gard.* 28: 224. 1941. TYPE: Costa Rica. Puntarenas: Manzanillo, 22 June 1937, *M. Quirós C. 732* (holotype, F).

Polystemma Decaisne has long been considered a synonym of *Matelea* Aublet but was resurrected by Stevens et al. (2001) for the single species *P. viridiflorum* Decaisne. The only other names attributed to the genus, *Polystemma rupestre* Brandegee and *P. scopulorum* Brandegee are considered by this author to be synonyms of *P. viridiflorum*. This is thus the second species of *Polystemma*; however, about 18 additional Mexican species, currently placed in *Matelea*, will be added in a fuller taxonomic treatment. Species of *Polystemma* can be distinguished from those of the current concept of *Matelea* by having glandular trichomes that are initially translucent but turn white and crystalline with age, while those of *Matelea*, when present, are red, yellow, brown, or black and do not become crystalline. The glandular trichomes of the related genus *Dictyanthus* are also translucent but remain translucent. The follicles of *Polystemma* are long, thin, symmetrical, smooth, and mottled, states individually rare or non-existent in *Matelea* and never found in this combination. The distal-dorsal margin of the outer corona of *Polystemma* is usually provided with long, filiform appendages, although these can be short in some species or, in the case of *Polystemma guatemalense*, stout.

The holotype of *Labidostelma guatemalense* was at B and is no longer extant. A fragment of the holotype at F, although small, serves as an adequate lectotype.

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Literature Cited

- Breedlove, D. E. 1986. Flora de Chiapas. Listados Florist. Mexico 4: i–v, 1–246.
- Decaisne, J. 1838. Études sur quelques genres et espèces de la famille des Asclépiadées. Ann. Sci. Nat., Bot., sér. 2, 9: 257–278, 321–348, pl. 9–12.
- . 1844. Asclepiadeae. In A. L. P. P. de Candolle, Prodrum Systematis Naturalis Regni Vegetabilis 8: 490–665.
- Goyder, D. J. & A. Nicholas. 2001. A revision of *Gomphocarpus* R. Br. (Apocynaceae: Asclepiadeae). Kew Bull. 56: 769–836.
- Gray, A. 1886a. Asclepiadaceae. Syn. Fl. N. Amer. (ed. 2) 2(1): 85–106, 401–404, 462.
- . 1886b. Contributions to American botany. XXIV. 2. Sertum Chihuahense. Proc. Amer. Acad. Arts 21: 378–413.
- Greuter, W., J. McNeill, F. R. Barrie, H. M. Burdet, V. Demoulin, T. S. Filgueiras, D. H. Nicolson, P. C. Silva, J. E. Skog, P. Trehane, N. J. Turland & D. L. Hawksworth (editors). 2000. International Code of Botanical Nomenclature (Saint Louis Code). Regnum Veg. 138.
- Lundell, C. L. 1938. Studies of Mexican and Central American Plants, VI. Amer. Midl. Naturalist 20: 236–242.
- Morillo, G. N. 1997. Asclepiadaceae. In J. A. Steyermark, P. E. Berry & B. K. Holst, Flora of the Venezuelan Guayana 3: 129–177.
- Omlor, R. 1998. Generische Revision der Marsdenieae (Asclepiadaceae). Dissertation, Universität Kaiserslautern. Shaker Verlag, Aachen.
- Rothe, W. 1915. Über die Gattung *Marsdenia* R. Br. und die Stammpflanze der Condurangorinde. Bot. Jahrb. Syst. 52: 354–434.
- Standley, P. C. & L. O. Williams. 1969. Flora of Guatemala. Asclepiadaceae. Fieldiana, Bot. 24 (8, part 4): 407–472.
- Stevens, W. D. 2001. Asclepiadaceae. In G. C. de Rzedowski & J. Rzedowski (editors), Flora Fanerogámica del Valle de México, ed. 2. Instituto de Ecología, Pátzcuaro, México.
- , C. Ulloa U., A. Pool & O. M. Montiel, editors. 2001. Flora de Nicaragua. Monogr. Syst. Bot. Missouri Bot. Gard. 85: i–xlii, 1–2666.
- Woodson, R. E., Jr. 1941. North American Asclepiadaceae I. Perspective of the genera. Ann. Missouri Bot. Gard. 28: 193–244.
- . 1954. The North American Species of *Asclepias* L. Ann. Missouri Bot. Gard. 41: 1–211.